

MAT 126 Calculus B Spring 2005 Practice Midterm II

Answer each question in the space provided and on the reverse side of the sheets. Show your work whenever possible. Unless otherwise indicated, **answers without justification will get little or no partial credit!** Cross out anything that grader should ignore and circle or box the final answer. The actual exam will contain 5 problems. This practice test contains more problems to give you more practice.

1. Evaluate the following definite integrals

(a)

$$\int_0^{13} \frac{2}{(2x+1)^{\frac{2}{3}}} dx$$

(b)

$$\int_0^{\frac{\pi}{2}} e^{\sin x} \cos x dx$$

(c)

$$\int_0^1 x^4(1+x^5)^{20} dx$$

(d)

$$\int_0^1 \tan^{-1} x dx$$

(e)

$$\int_0^{\frac{\pi}{2}} \cos^5 t dt.$$

2. Evaluate the following indefinite integrals

(a)

$$\int x^3 e^{x^4} dx$$

(b)

$$\int te^t dt$$

(c)

$$\int x^2 \cos x dx$$

(d)

$$\int \cos(\sqrt{x}) dx$$

3. Evaluate the following indefinite integrals

(a)

$$\int \frac{1}{x^2} \ln x dx$$

(b)

$$\int \frac{1}{x} (\ln x)^2 dx$$

4. Evaluate the following indefinite integrals

(a)

$$\int \frac{2x^2}{x^2 + 1} dx$$

(b)

$$\int \frac{2}{x^2 - 1} dx$$

(c)

$$\int \frac{2x}{x^2 + 1} dx$$

5. (a) Write a formula for $\tan x$ in terms of $\sin x$ and $\cos x$.

(b) Evaluate

$$\int \tan x dx$$

6. Evaluate

$$\int \sqrt{16 - x^2} dx$$

7. (a) Set

$$f(x) = \int_1^{x^2} \sin t^3 dt$$

Find $f(1)$ and $f'(x)$.

(b) Set

$$f(x) = \int_{\sqrt{x}}^{x-2} \tan^2 t dt$$

Find $f(4)$ and $f'(x)$.